

## CLAIMS

1. A transgenic bird  
which is obtained as a G1 transgenic bird or an offspring  
5 thereof by: incubating a fertilized avian egg,
  - a) microinjecting, into the early embryo thereof at a stage  
except for and after the blastodermic stage just after egg  
laying, a replication-deficient retroviral vector coding for  
a desired protein,
  - 10 b) allowing the egg to hatch out to thereby obtain a G0  
transgenic chimeric bird, and
  - c) mating the G0 transgenic chimeric bird with another  
G0 transgenic chimeric bird or an offspring thereof or with a  
wild-type bird.
- 15 2. The transgenic bird according to Claim 1  
wherein the early embryo is at least 24 hours after the  
start of incubation.
- 20 3. The transgenic bird according to Claim 2  
wherein the early embryo is at least 48 hours after the  
start of incubation.
- 25 4. The transgenic bird according to any one of Claims 1  
to 3  
wherein the desired protein is an antibody.
5. The transgenic bird according to any one of Claims 1  
to 4  
30 wherein the bird is a chicken or a quail.
6. A transgenic bird  
which is a G2 transgenic bird or an offspring thereof  
obtained by mating the G1 transgenic bird according to any one  
35 of Claims 1 to 5 with a G0 transgenic bird, another G1 transgenic

bird or an offspring thereof, or with a wild-type bird.

7. A method for constructing a G1 transgenic bird which comprises incubating a fertilized avian egg,
- 5 a) microinjecting, into the early embryo thereof at a stage except for and after the blastodermic stage just after egg laying, a replication-deficient retroviral vector coding for a desired protein,
- b) allowing the egg to hatch out to thereby obtain a G0
- 10 transgenic chimeric bird, and
- c) mating the G0 transgenic chimeric bird with another G0 transgenic chimeric bird or an offspring thereof or with a wild-type bird.

- 15 8. The method for constructing a transgenic bird according to Claim 7
- wherein the early embryo is at least 24 hours after the start of incubation.

- 20 9. The method for constructing a transgenic bird according to Claim 8
- wherein the early embryo is at least 48 hours after the start of incubation.

- 25 10. The method for constructing a transgenic bird according to any one of Claims 7 to 9
- wherein the desired protein is an antibody.

11. The method for constructing a transgenic bird
- 30 according to any one of Claims 7 to 10
- wherein the bird is a chicken or a quail.

12. The method for constructing a transgenic bird according to any one of Claims 7 to 11
- 35 which comprises microinjecting a replication-deficient

retroviral vector having a titer of not lower than  $1 \times 10^7$  cfu/ml.

13. The method for constructing a transgenic bird according to Claim 12

5       which comprises microinjecting a replication-deficient retroviral vector having a titer of not lower than  $1 \times 10^9$  cfu/ml.

14. A method for constructing a transgenic bird which comprises mating the G1 transgenic bird according to any one of Claims 1 to 5 with a G0 transgenic bird, another G1 transgenic bird or an offspring thereof or with a wild-type bird to construct a G2 transgenic bird or an offspring thereof.

15. A method for producing a protein which comprises extracting a desired protein from somatic cells, blood or eggs from a transgenic bird constructed by the method according to any one of Claims 7 to 14.

16. A method for sorting out a reproductive lineage transgenic chimeric bird which comprises collecting sperm samples from transgenic birds according to any one of Claims 1 to 6 and testing them for the gene in the sperm.

17. The method for constructing a transgenic bird according to any one of Claims 7 to 14 wherein the replication-deficient retroviral vector is a vector derived from Moloney murine leukemia virus.

18. The method for constructing a transgenic bird according to any one of Claims 7 to 14 wherein the replication-deficient retroviral vector is VSV-G pseudotyped.

19. The method for constructing a transgenic bird

according to any one of Claims 7 to 14, 17 and 18  
wherein the replication-deficient retroviral vector  
contains a non-retrovirus-derived gene.

5           20. The method for constructing a transgenic bird  
according to Claim 19  
          wherein the non-retrovirus-derived gene is controlled  
under the chicken  $\beta$ -actin promoter.

10           21. The method for constructing a transgenic bird  
according to Claim 19 or 20  
          wherein the non-retrovirus-derived gene codes an  
antibody.

15           22. The method for constructing a transgenic bird  
according to Claim 21  
          wherein the antibody is a chimeric antibody.

          23. The method for constructing a transgenic bird  
20 according to Claim 22  
          wherein the chimeric antibody is scFv-Fc antibody.

          24. The transgenic bird  
          which is constructed by the method according to any one  
25 of Claims 7 to 14 and 17 to 23.

          25. An egg laid by the transgenic bird according to Claim  
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          which contains not lower than 1 mg/100 g of the desired  
30 protein.

          26. An egg laid by the transgenic bird according to Claim  
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          which contains not lower than 20 mg/100 g of the desired  
35 protein.

27. An egg laid by the transgenic bird according to Claim  
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5 which contains not lower than 100 mg/100 g of the desired  
protein.

28. A method for sorting out a reproductive lineage  
transgenic chimeric bird

10 which comprises incubating a fertilized avian egg,  
microinjecting, into the early embryo thereof at a stage except  
for and after the blastodermic stage just after egg laying, a  
replication-deficient retroviral vector coding for a desired  
protein and confirming the gene coding for the desired protein  
in the sperm of the male G0 transgenic bird obtained by hatching.

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29. A method for sorting out a transgenic bird

which comprises confirming the expression of the desired  
protein in the blood of the transgenic bird according to any  
one of Claims 1 to 6.

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30. A method for sorting out a G0 transgenic chimeric bird

25 which comprises incubating a fertilized avian egg,  
microinjecting, into the early embryo thereof at a stage except  
for and after the blastodermic stage just after egg laying, a  
replication-deficient retroviral vector coding for a desired  
protein and confirming the expression of the desired protein  
in the blood of the G0 transgenic bird obtained by hatching.

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